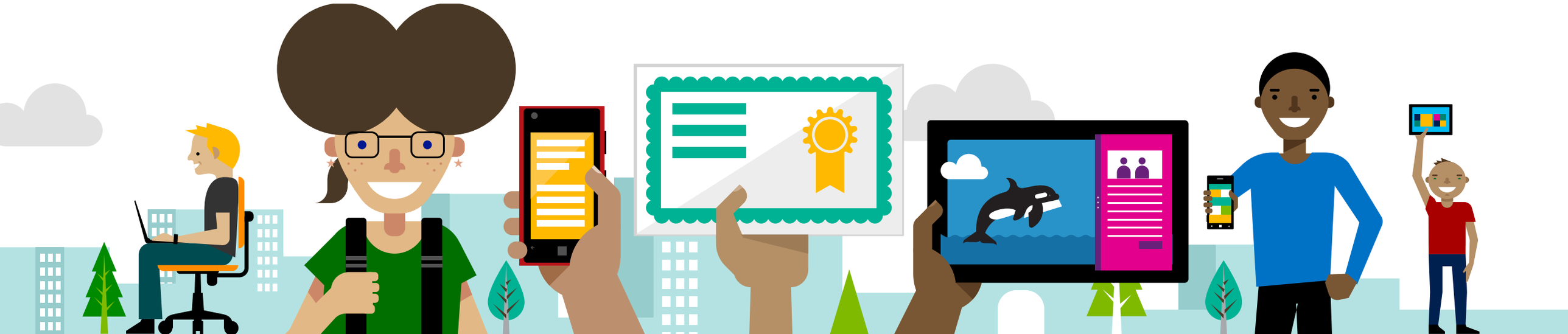
Microsoft

Understanding CSS Essentials: Layouts

3.2. Arrange user interface (UI) content by using CSS.



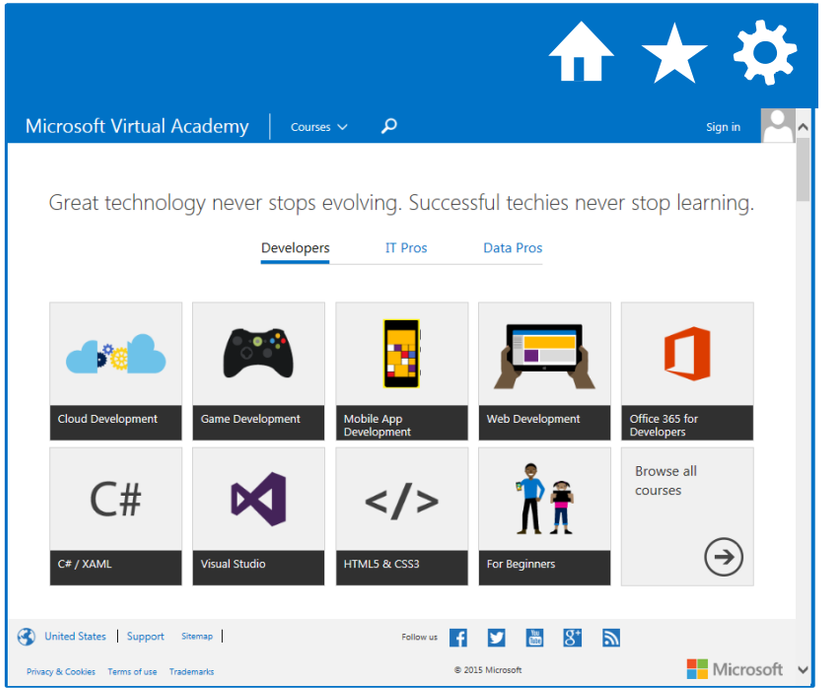
Agenda

1	The User Interface
2	The CSS Box Model
3	The Flexbox Box Model
4	Grid Layouts

The User Interface

The User Interface (UI)

- The portion of a Web page where users interact is called the **user interface (UI)**
- The layout of a user interface will dramatically impact a user experience
  - layouts can range from minimalist with just a few elements, to pages that are jammed full with content
- Simple layouts and complex layouts require different models to ensure that content displays properly for users



Vendor Prefixes

- As with HTML5, CSS3 is still in a draft format and might not be compatible with all browsers
  - New properties are being added all the time, while others are being modified
- Many browsers offer alternative property names to workaround any compatibility problems
- These property names must be used in conjunction with a vendor prefix
  - A vendor prefix is simply a keyword that is surrounded by dashes

WEB BROWSER	PREFIX
Internet Explorer	`-ms-`
Firefox	`-moz-`
Opera	`-o-`
Chrome	`-webkit-`
Safari	`-webkit-`

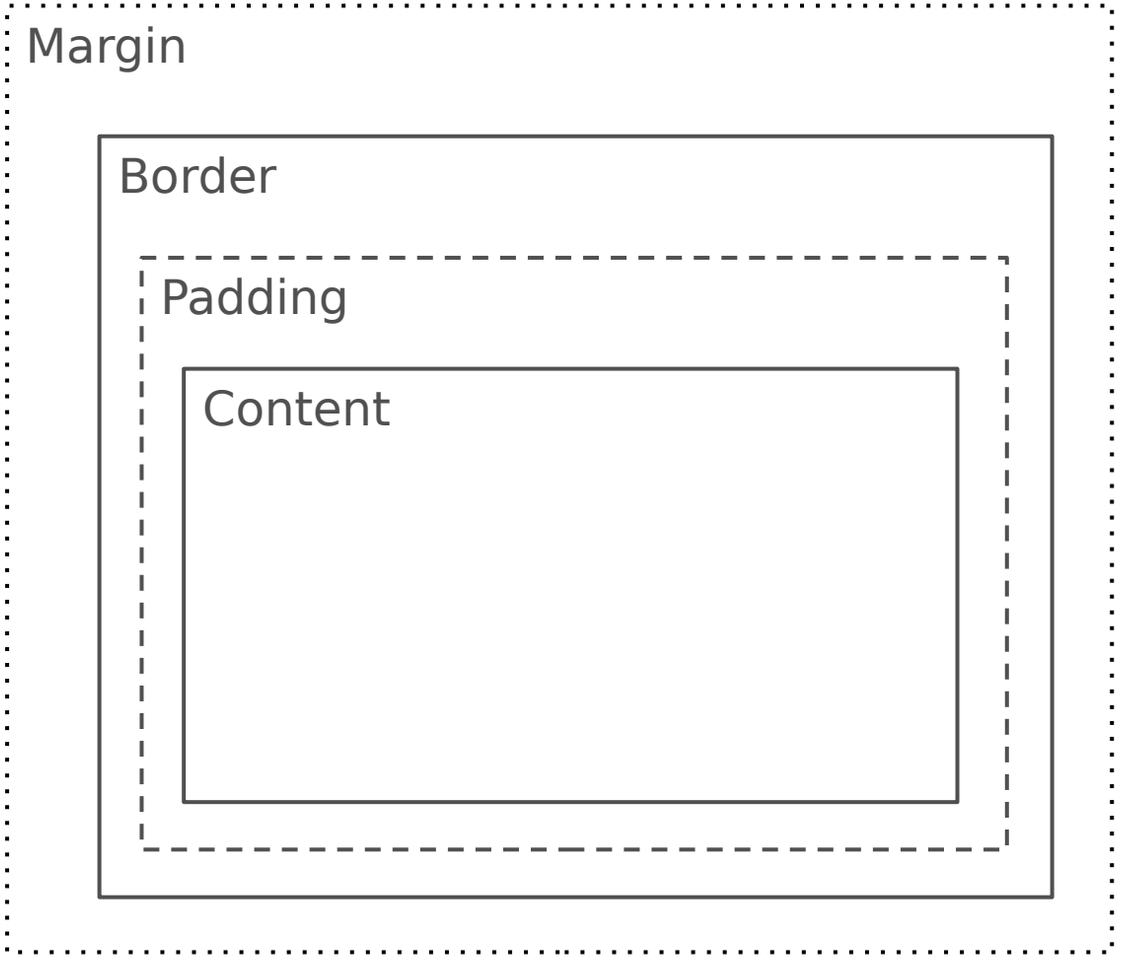
Vendor Prefixes in Action

- To apply the flexbox style to elements in a browser, like Chrome, you simply add the `-webkit-flexbox` property to your CSS
- A best practice is to include the property with all four vendor prefixes
  - This will increase the likelihood that your Web page will render correctly
- If you have questions about whether your property will display properly, then check out **caniuse.com**

The CSS Box Model

The CSS Box Model, pt. 1

- The **CSS Box model** defines the rules for how content is formatted on a Web page or Web application
- Each element of HTML is in a box that multiple components, including padding, border, and margin
  - **Padding** is the space between the content and its border
  - **Border** surrounds the box that content sits inside
  - A **margin** is the space that surrounds the box and sits between other boxes in a Web document



Block-level and Inline Elements

Within the CSS Box model, there are two categories of elements

- block-level
- inline

Block-level elements create boxes that are a part of a pages layout

- this category includes articles, sections, paragraphs, headers, footers and more

Inline elements are used to format content

- this category includes emphasis and boldface

BLOCK LEVEL ELEMENT EXAMPLES

- `<div>`
- `<p>`
- `<ul>, <ol>, <dl>`
- `<h1> - <h6>`
- `<form>`

INLINE ELEMENT EXAMPLES

- `<img/>`
- `<a>`
- `<strong>`
- `<em>`
- `<input>`

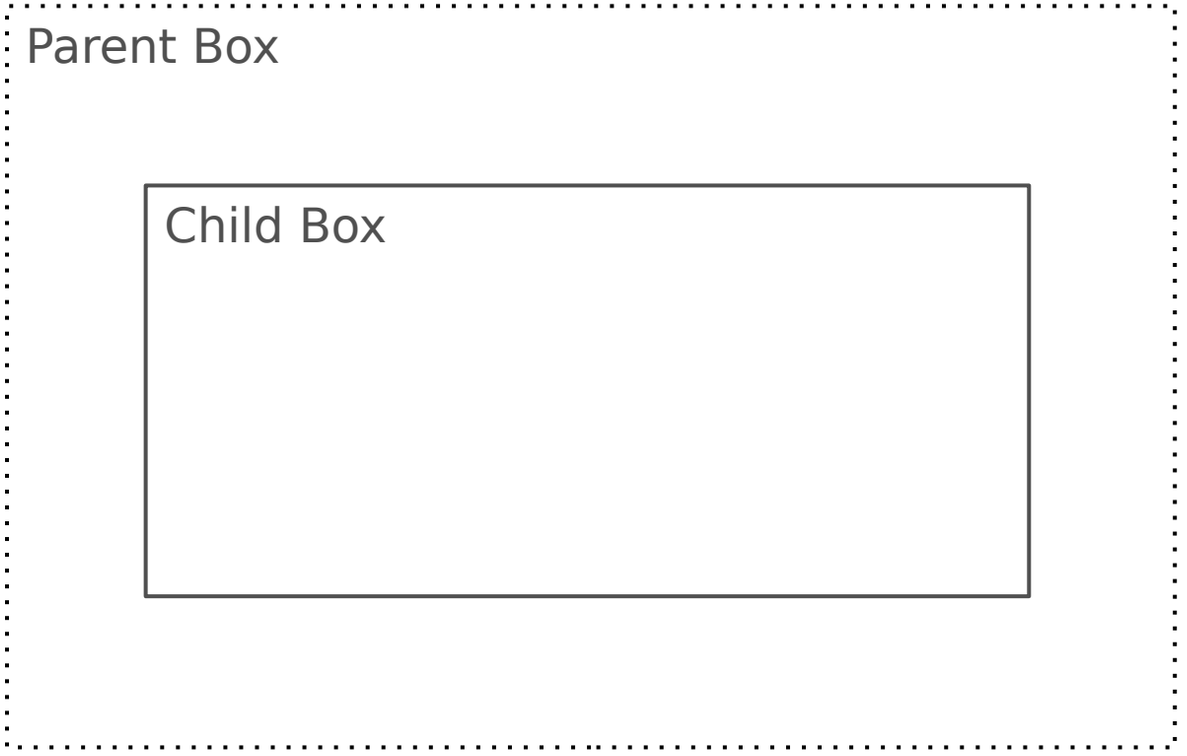
Parent/Child Relationship

With the CSS Box model, it is possible for a box to contain one or more boxes

- The outer box is referred to as the parent
- An inner box is referred to as a child
  - This is similar to nesting tags in HTML

A child inherits CSS styles from a parent, which means that styles applied to a parent will apply to a child as well

- This isn’t the case for all CSS properties



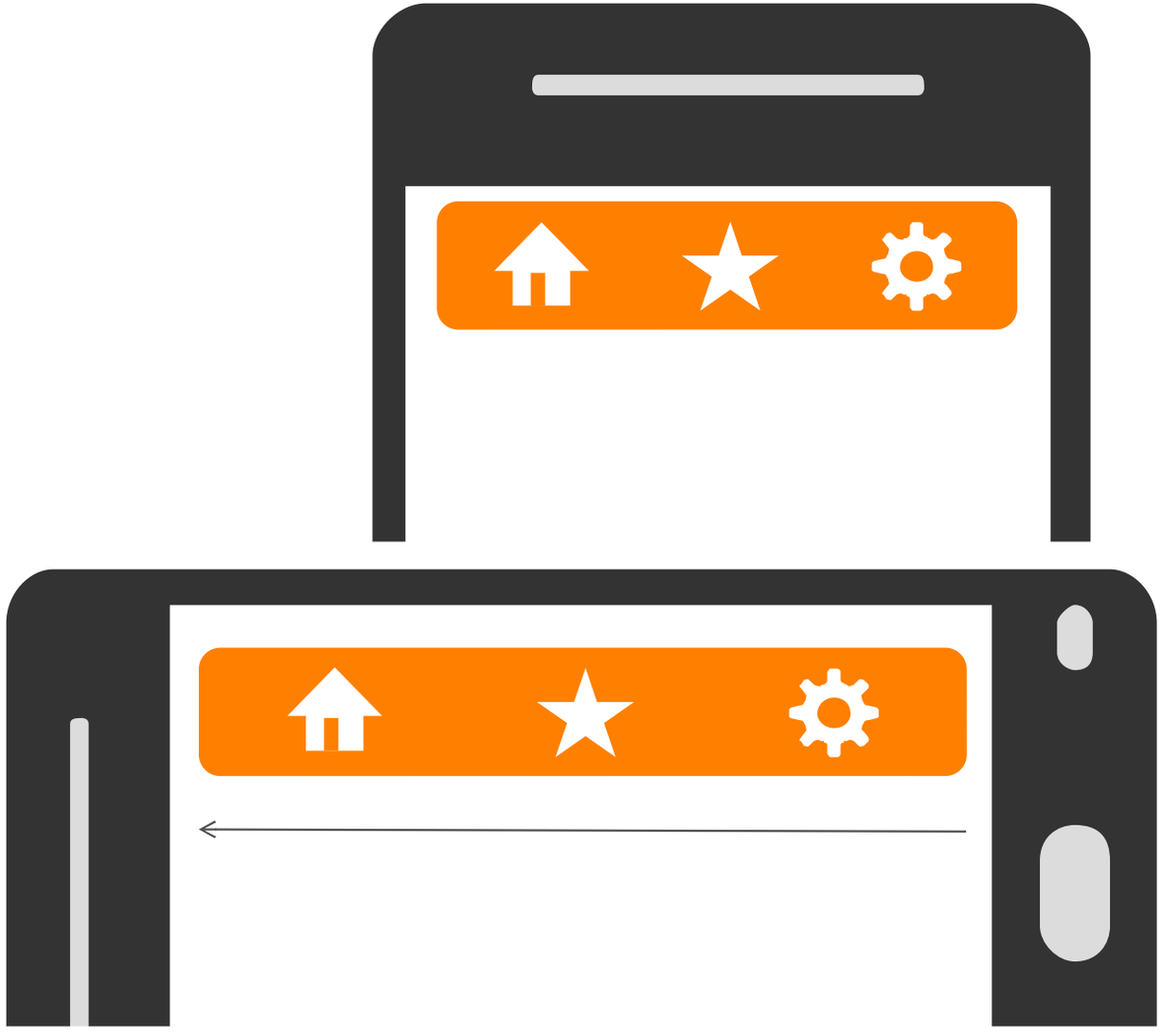
Problems with the CSS Box Model

- The CSS Box model is not without problems
- Some browsers will apply properties differently
  - For example, height and width are supposed to be separate attributes but sometimes aren’t treated as such by older browsers

Flexboxes

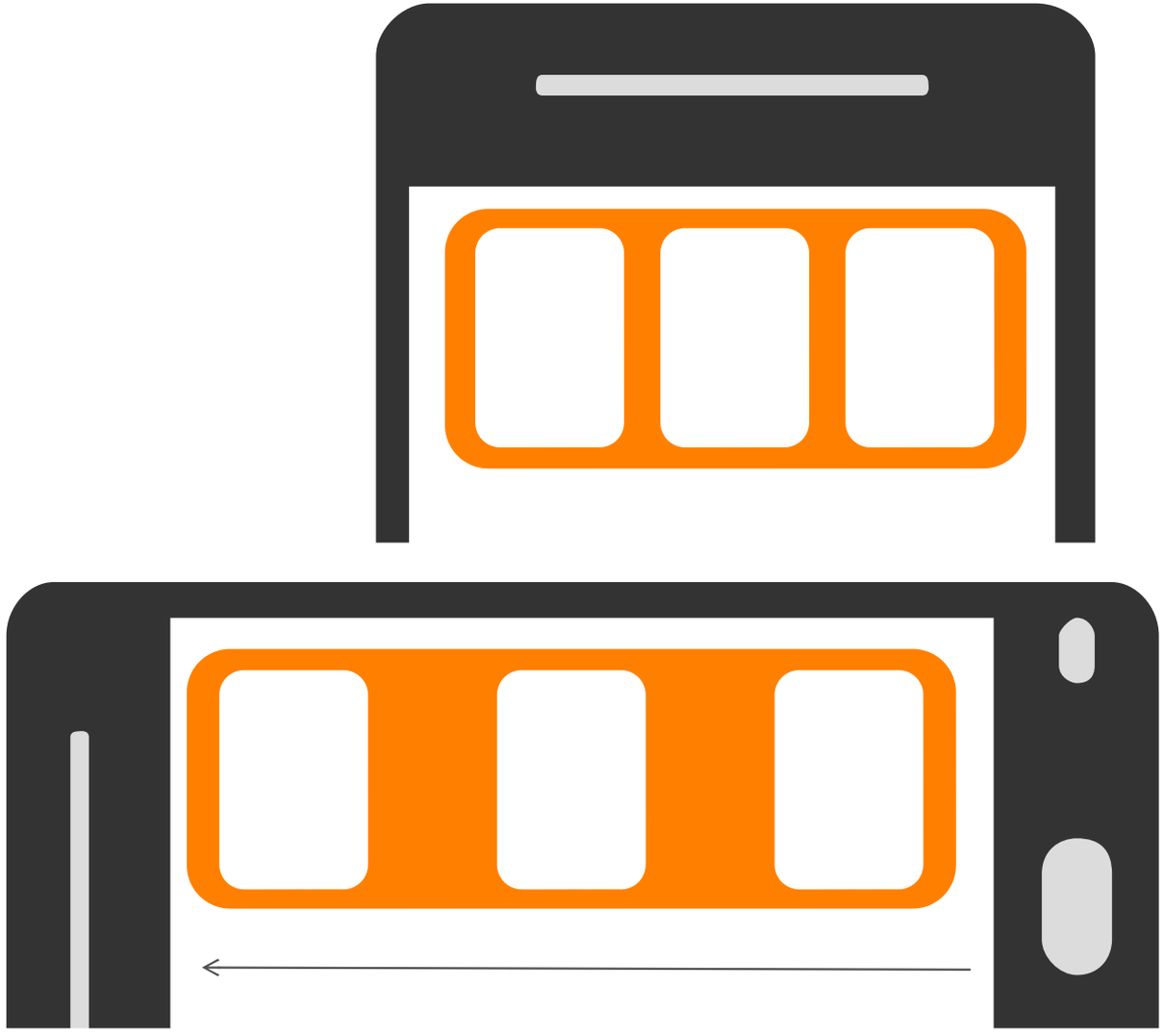
The CSS Flexbox Box Model

- CSS3 now includes the **Flexbox Box model**, a layout mode that provides flexibility when a user changes the size of their browser window
- Elements, navigation bars, forms and pictures will resize and reposition automatically to fill available space
- We use **media queries** to determine which device is being used
  - CSS uses this information to automatically adjusts our HTML document to fit a screen



Flexbox Items

- An element is defined as a flexbox using the `display` property
- The display property possesses two values: `flexbox` and `inline-flexbox`
  - the `flexbox` value sets the flexbox as a block-level element
  - the `inline-flexbox` value sets the flexbox as an inline-level element



Flexbox Properties and Values, pt. 1

Flexbox introduces nine other properties, each with their own set of unique values

PROPERTY	VALUE(S)	DESCRIPTION

`flex`	`pos-flex`
	`neg-flex`
	`preferred-size`
	`none`
		Makes child boxes flexible by height and width

`flex-align`	`start`
	`end`
	`center`
	`baseline`
	`stretch`
		Sets the default alignment for child boxes; if the orientation of the parent box is horizontal, flex-align determines the vertical alignment of the child boxes and vice versa

Flexbox Properties and Values, pt. 2

PROPERTY	VALUE(S)	DESCRIPTION

`flex-direction`	`row`
	`row-reverse`
	`column`
	`column-reverse`
		Controls the direction of child boxes in the parent box; also affects the flex-pack property

`flex-flow`	`flex-direction` `flex-wrap`	Sets the flex-direction and flex-wrap properties at the same time

`flex-item-align`	`auto`
	`start`
	`end`
	`center`
	`baseline`
	`stretch`
		Overrides the default alignment of child boxes styled with the flex-align property

Flexbox Properties and Values, pt. 3

PROPERTY	VALUE(S)	DESCRIPTION

`flex-line-pack`	`start`
	`end`
	`center`
	`justify`
	`distribute`
	`stretch`
		Sets child box alignment within the parent box when extra space exists

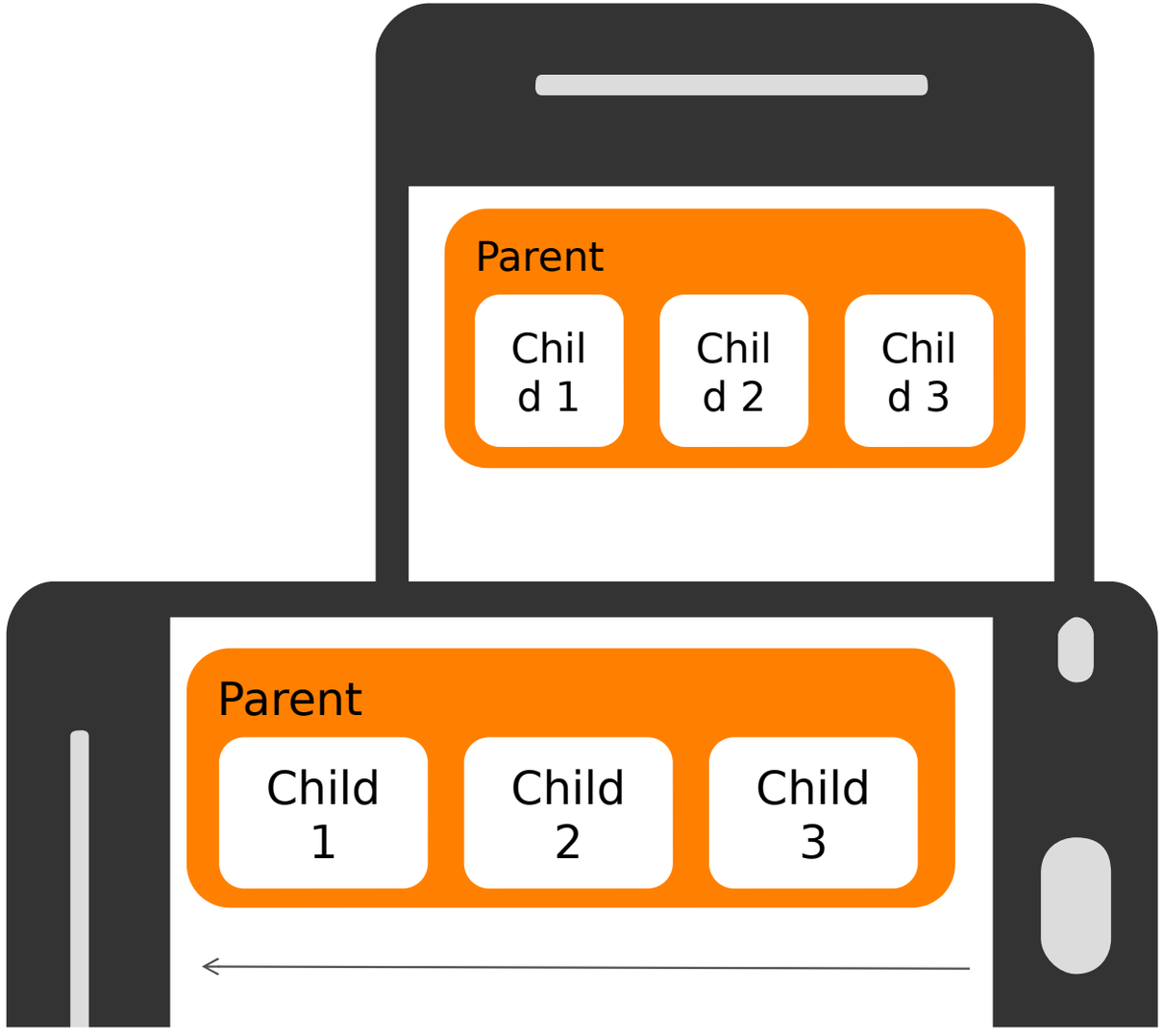
`flex-order`	`number`	Assigns child boxes to groups and controls the order in which they appear in a layout, beginning with the lowest numbered group

`flex-pack`	`start`
	`end`
	`center`
		Justifies the alignment of child boxes within a flexbox to ensure all whitespace in the parent box is filled

`flex-wrap`	`nowrap`
	`wrap`
	`wrap-reverse`
		Determines whether child boxes automatically create a new line and wrap onto it or overflow the flexbox

Working with Flexboxes

- Flexboxes can contain other boxes, or child boxes, which are referred to as **flexbox items**
- With the `flex` property, you can make the flexbox items flexible as well
  - recall that the `display` property is used to make parent boxes flexible
- The `flex` property can be used to proportionally scale flexbox items when the flexbox increases or decreases in size



Changing the Direction of Child Items

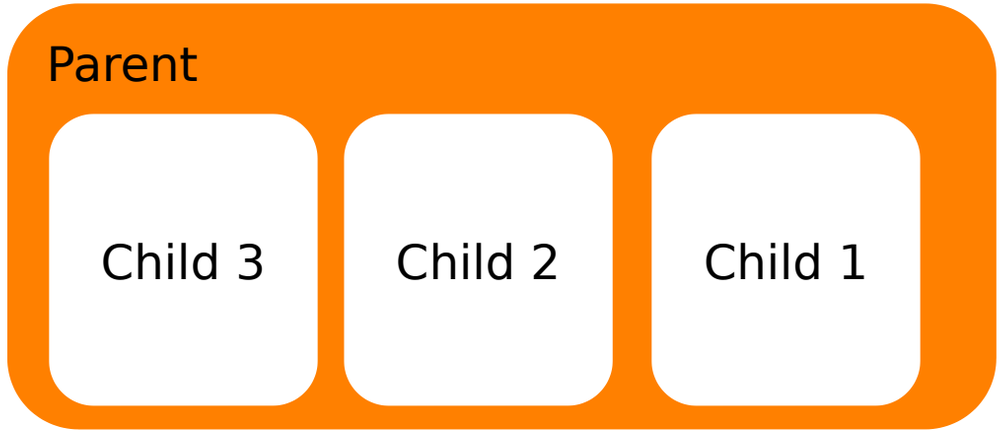
The `flex-direction` property allows developers to change the direction of child boxes in a flexbox

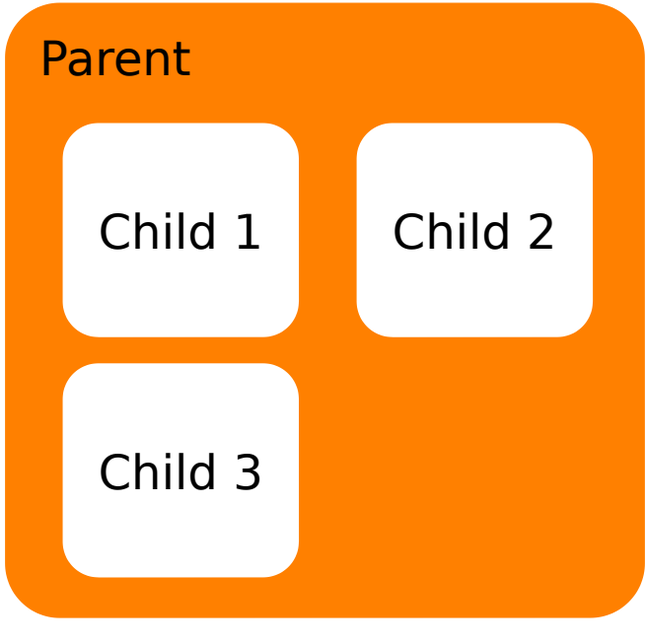
- it uses the `row`, `row-reverse`, `column`, and `column-reverse` values

The `flex-wrap` property determines if child boxes will wrap onto a new line when a window condenses

- it uses the `nowrap`, `wrap`, and `wrap-reverse` values

The `flex-flow` property sets the `flex-direction` and `flex-wrap` properties at the same time



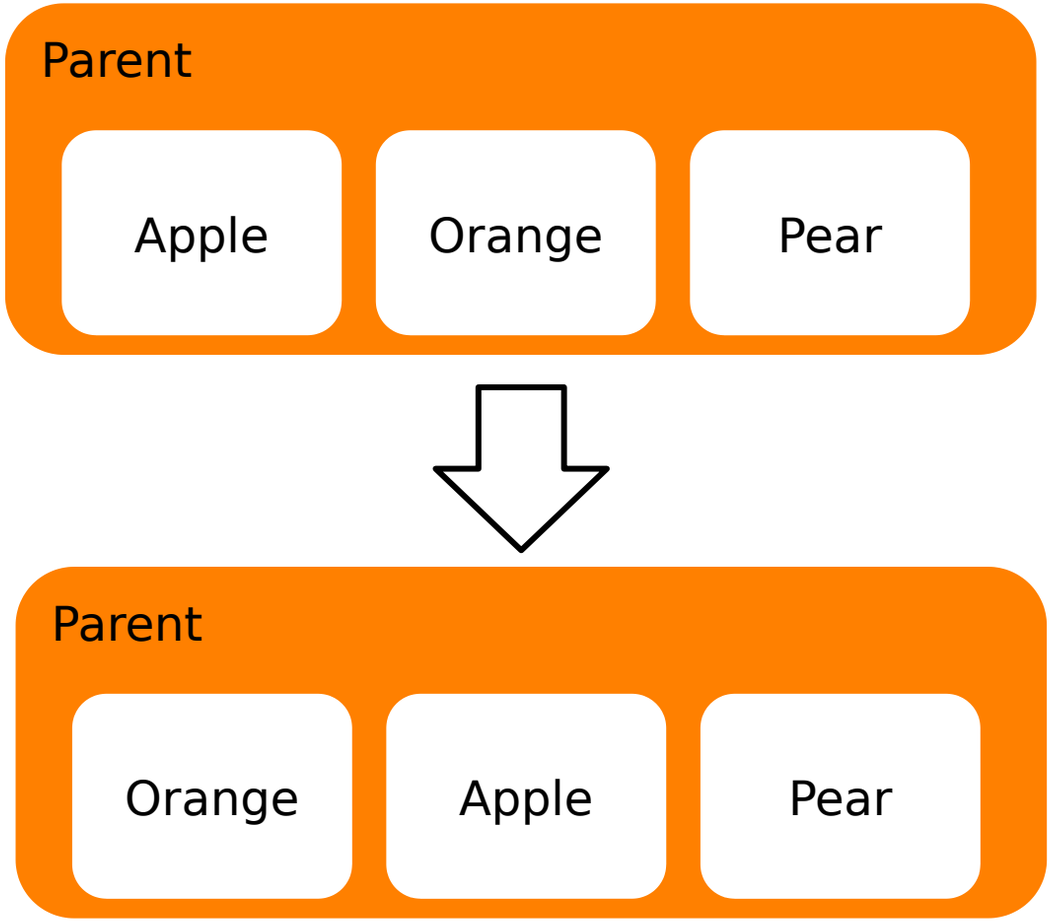


Flexbox Demo

```
<style type="text/css">
    #myFlexbox {
        display: -ms-flexbox;
        -ms-flex-direction: row | row-reverse | column | column-reverse;
        -ms-flex-wrap: wrap;
        background: gray;
        height: auto;
    }
    #childBlue {
        background: blue;
        height: 80px;
        width: 100px;
    }
    #childGreen {
        background: green;
        height: 80px;
        width: 100px;
    }
</style>
```

Ordering and Arranging Content

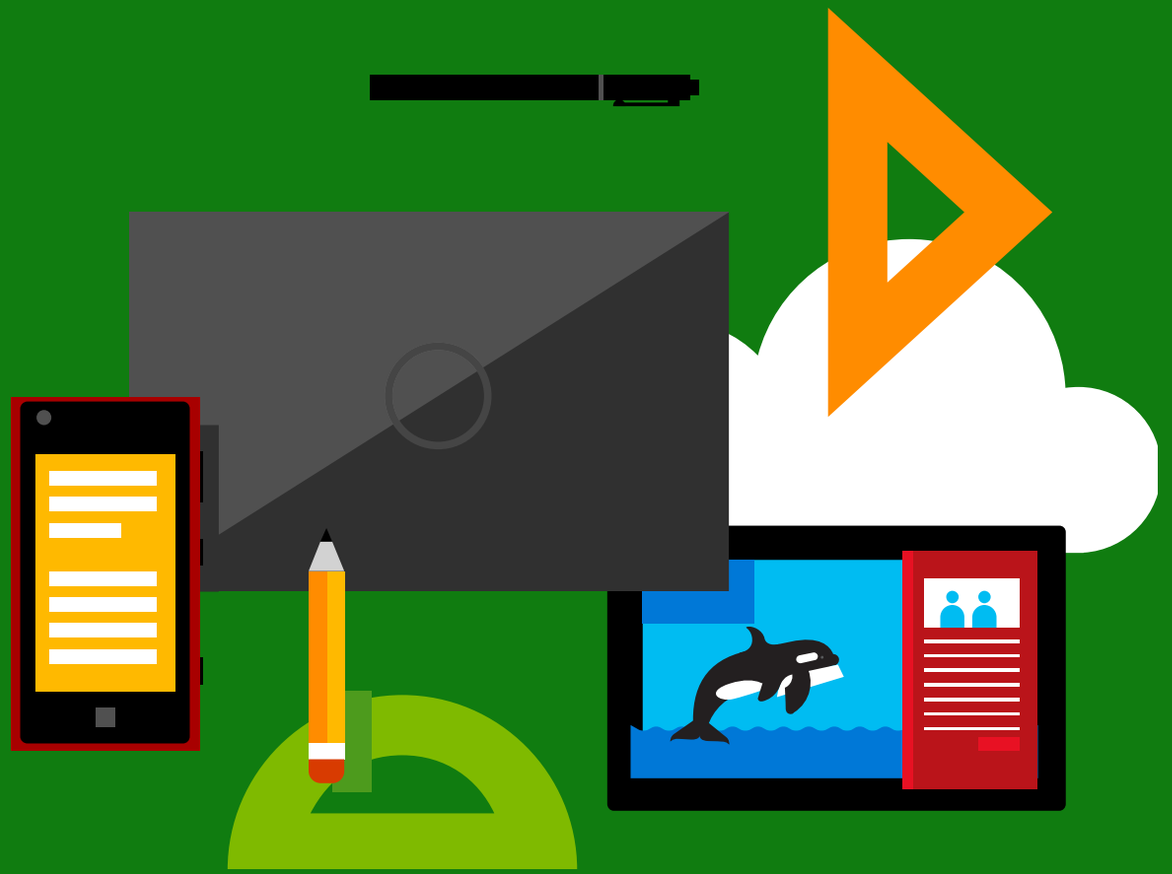
- The `flex-order` property allows you to adjust the order and arrangement of contents inside of a flexbox
- The property groups child boxes to control the order in which they appear in a layout
- The default value for the flex-order property is 0



More About Flexboxes

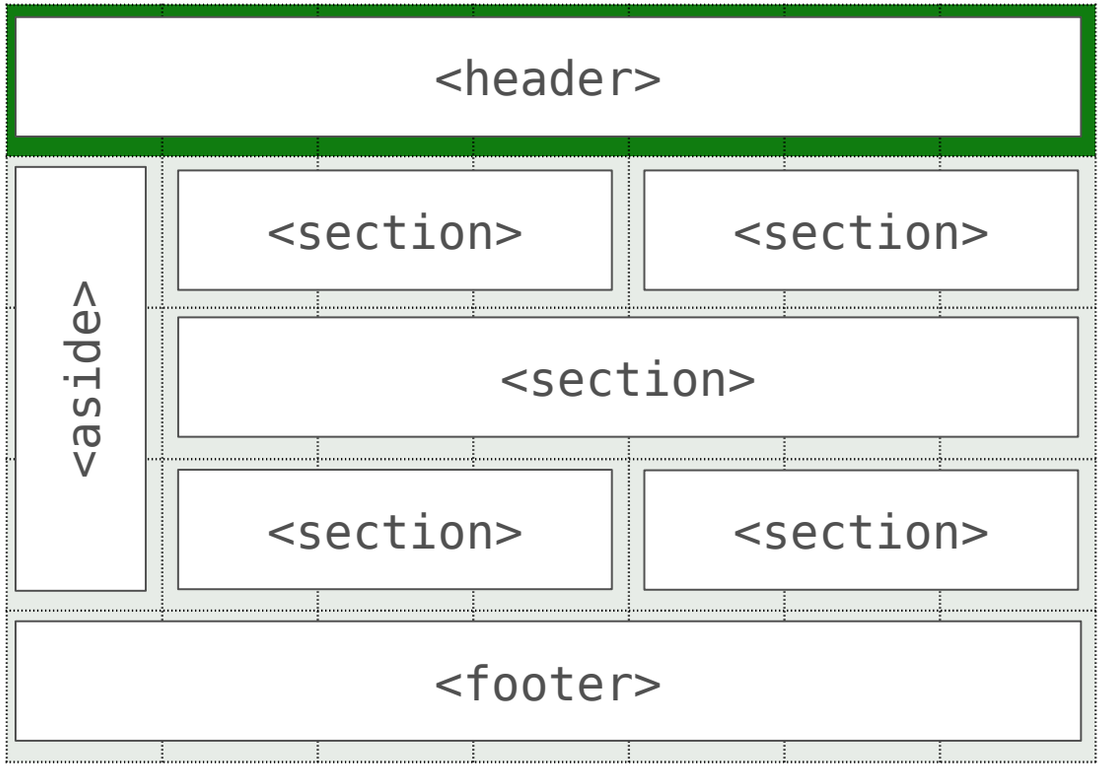
https://msdn.microsoft.com/en-us/library/hh673531(v=vs.85).aspx

Grid Layouts



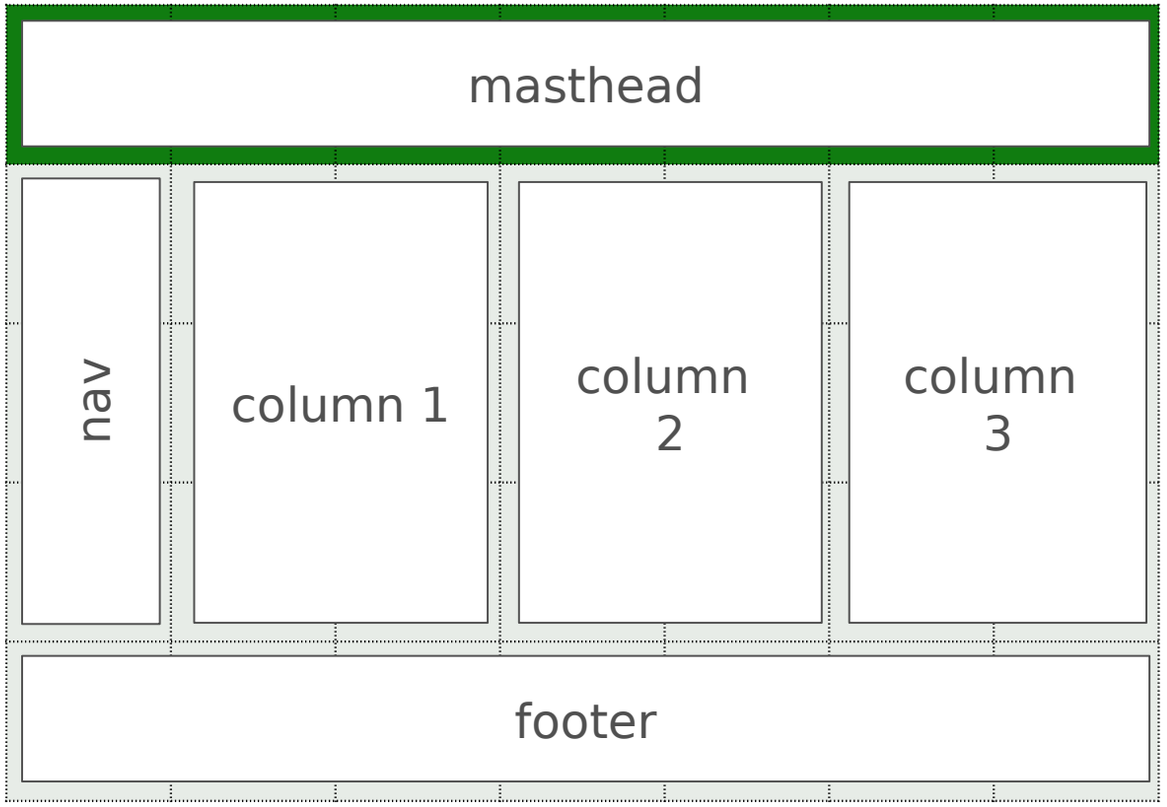
The Grid Layout Model

- When the Flexbox Box model isn’t appropriate, you can use the Grid Layout model
- The Grid Layout model uses CSS to structure content using rows and columns
- Grids are extremely flexible and provide an easier to use option for organizing content than HTML tables



Grid layouts and Grid Items

- Grid layouts are very similar to tables because they feature rows and columns
- They are best suited for more complex layouts – like those required by newspapers – than flexboxes can handle
- The content in grid layouts are also modular, which allows you to move content from one part of the page to another



Defining the Grid Layout

- Define a grid layout by using the `display` property, along with the `grid` or `inline-grid` values
- Child elements in a grid are called grid items, which can be positioned according to grid tracks, grid lines, or grid cells

LAYOUT CONCEPT	DESCRIPTION
Grid tracks	The columns and rows of a grid
Grid lines	The horizontal and vertical lines that separate columns and rows
Grid cells	The logical space where content is placed

Grid Properties and Values, pt. 1

PROPERTY	VALUE(S)	DESCRIPTION
`grid-columns` or `grid-rows`	`length` `percentage` `fraction` `max-content` `min-content` `minmax(min,max)` `auto`	Specifies parameters for one or more columns or rows in a grid
`grid-template`	`string+` `none`	Provides a visualization of the grid element’s structure and defines the grid cells
`grid-cell`	`string` `none`	Positions a child item inside a named grid cell

Grid Properties and Values, pt. 1

PROPERTY	VALUE(S)	DESCRIPTION

`grid-column`
`or`
`grid row`
	`[integer or string start]`
	`[integer or string end]`
	`auto`
		Places child items in a grid

`grid-column-span`
`or`
`grid-row-span`
	`integer`	Defines the dimensions of a grid cell by specifying the distance (in lines) from the string line to the ending line

`grid-column-sizing`
`or`
`grid-row-sizing`
	`none`
	`rows`
	`columns`
		Creates additional columns or rows as needed to accommodate content

`grid-column-align`
`or`
`grid-row-align`
	`start`
	`end`
	`center`
	`stretch`
		Controls a child item’s alignment within a cell

Grid Layout Demo

```
<style>
    #gridded {
        display: -ms-grid;
        background: gray;
        -ms-grid-columns: 10px 250px 10px 250px 10px 250px 10px 250px 10px;
        -ms-grid-rows: 1fr;
    }
    #item1 {
        background: orange;
        -ms-grid-row: 1;
        -ms-grid-column: 1;
    }
    #item2 {
        background: purple;
        -ms-grid-row: 2;
        -ms-grid-column: 2;
    }
</style>
```

More About Grid Layouts

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Summary

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4	Grid Layouts